



A New Hybrid OR Improves Cardiac Treatment

*“The more I can see,
the clearer the image,
the easier and better
the outcomes are.”*

Kumara Rama, MD,
vascular surgeon,
St. John Hospital, Detroit, MI

St. John Hospital & Medical Center creates a state-of-the-art hybrid operating room (OR) to advance a full structural heart program that will enable new levels of patient care.

Thomas LaLonde, MD

Chief of Cardiology and
Cardiovascular Services,
St. John Hospital, Detroit, MI

“Everybody is very excited about doing cases in the hybrid room because it is beautiful – with amazing technology – and we’ve had nothing but excellent support from Siemens and excellent outcomes in every case we’ve done in there so far.”

Situated on the east side of Detroit, Michigan, between the cusp of the city limits and the suburb of Gross Pointe, St. John Hospital & Medical Center serves a steady stream of patients from all walks of life. Long known for its cardiac expertise, the center performs about 2,000 percutaneous coronary and peripheral interventions and 400 open heart surgeries, including minimally invasive and robotic surgery. Now this 772-bed tertiary care facility is taking its next step toward cardiac excellence: a full structural heart program. A new hybrid OR is the vital catalyst to further this goal.

Creating the Right Environment

“We feel it is very important to stay at the cutting edge of technology,” said Thomas LaLonde, MD, Chief of Cardiology and Cardiovascular Services. “If you really want to create a structural heart program, we felt very strongly that having sophisticated imaging in a hybrid lab in conjunction with the sterile environment of an operating room would be paramount to that success.”

Sanjay Batra, MD, Chief of Cardiothoracic Surgery, concurs. “We felt it was very important to invest in our structural heart program – from both a physician standpoint and a system standpoint. Therefore, our first step was to build a state-of-the-art facility that enables us to perform hybrid procedures with the precision that is required.”

With their vision to build a new hybrid suite firmly rooted, decision-makers at St. John Hospital proceeded to select a location for their room. Since space was conveniently available in the operating room, they selected the OR over the cath lab. This spared them the time and expense to recreate a sterile environment.



Enhanced Care for Complex Patients

The hybrid OR at St. John Hospital has been busy since its debut, supporting more than 900 cases to date. The majority of cases comes from vascular surgery, but the room is also used for neurology, thoracic and cardiovascular procedures, including over 50 TAVR cases. Looking ahead, it will be the preferred site for complex endovascular work that otherwise could not be achieved in either a conventional operating room or a cath lab setting. According to Kumara Rama, MD, vascular surgeon, "To me, a hybrid OR is an absolute must for certain procedures like a thoracic aortic aneurysm, aortic dissection, percutaneous valve, and the c-clip for the mitral valve. These kinds of procedures cannot be done without a powerful C-arm."

Further, the hybrid OR offers new options to patients who would have been excluded from surgery in the past. "With the development and advancement of angioplasty and stents and better long-term results, the number of patients requiring coronary bypass surgery is decreasing," said Dr. Batra. "As patients are living longer, however, the need for valvular surgery is increasing. As technology advances, we are able to perform these procedures on patients who would not have been operative candidates in the past. But if you don't have a state-of-the-art facility to perform these procedures, the results will certainly not be what we expect or need."

Dr. LaLonde added, "I think the multidisciplinary approach cultivated within a hybrid OR is of utmost importance. For example, a percutaneous aortic valve procedure requires a cardiologist and a cardiothoracic surgeon working side by side. Therefore, the patient benefits from a hybrid approach to care involving multiple specialties."

In addition, patients benefit from physicians' ability to provide a combined surgical intervention that addresses multiple conditions in a single setting – thereby increasing patient safety, reducing infection rates, and speeding the time to recovery. Tom Davis, MD, Director of the Cardiac Cath Lab and Peripheral Vascular Program, recounts one case involving a patient diagnosed with severe three vessel cardiac disease and a more than 80% stenosis in the carotid. Clinicians accomplished two procedures at the same time. "In the hybrid OR, we started by performing a carotid stent, did our procedure, and then the patient was prepped for bypass surgery. The anesthesia time is shorter for the patient because we did conscious sedation for the stent. From our standpoint, in terms of OR time, the combined procedure is much quicker than a carotid endarterectomy and bypass surgery. Plus, if there are complications, you can have the chest opened up within minutes. I truly believe the hybrid OR is safer for these patients."

Interestingly, the hybrid OR introduces another significant factor linked to patient care: the ability to participate in nationally renowned trials. Dr. Batra explained, "I think having the clinical expertise, the clinical results, and just as important, a world-class facility, will enable us to be selected for trials. This will allow our patients to understand and to appreciate the expertise that we offer. After all, our ultimate goal is patient care – what's best for the patients and their families."



Lessons Learned

A committee of about 15 people, headed by Dr. LaLonde and representing a cross-section of multiple disciplines and staff, diligently worked together for nearly a year to define the function of St. John Hospital's hybrid OR, identify the requisite technology, and ultimately configure the space. The result is close to pristine.

Committee members agree that site visits to view the technology in action was an invaluable part of the process. The visits also helped the committee members to visualize the space requirements for the room vis-à-vis the equipment, staff, cabinetry, and counter space that would need to be accommodated. The committee members unanimously agreed that "more is better" in terms of space. The room begins to shrink – particularly the ceiling space – as you add equipment. Dr. LaLonde advised, "It's important to do your homework. Go on multiple site visits to see a hybrid room and to talk to the people who put the room together. See what mistakes they made – we can always learn from each other's mistakes."

According to Michael Vicencio, applications specialist for cardiology, it's equally important to raise adequate funding early on. "There are always technology add-ons. Get buy-in from the different disciplines up front since this will determine which equipment is selected for the room."

Technology Requirements

The Artis zee ceiling-mounted C-arm system is the focal technology within St. John Hospital's hybrid OR. Physicians are impressed with the 3D imaging provided by *singo* DynaCT. "The more I can see, the clearer the image,

the easier and better the outcomes are," explained Dr. Rama. In addition, the flexibility and positioning capabilities of the ceiling-mounted system work best for the room – staff felt the system could be moved quickly and easily parked when not in use. Surgeons appreciate the design and automation of the system's table and believe it will ideally support the types of procedures they will handle. Affordability is another key benefit of the ceiling-mounted system.

The room is outfitted with an assortment of supporting equipment and features, as well. These include several booms, an array of lighting components, a video conference system with seven monitors, media streaming, and color balancing LED lights. However, the staff favorite is a video display with four LEDs that create a window effect. Here, a variety of tranquil, picturesque images help to soothe both the patients and OR staff.

The Rewards

Enthusiasm for the hybrid OR runs high among the staff at St. John Hospital – and with good reason. Dr. LaLonde summarized, "Everybody is very excited about doing cases in the hybrid room because it is beautiful – with amazing technology – and we've had nothing but excellent support from Siemens and excellent outcomes in every case we've done in there so far."

Contact

sabine.wich@siemens.com

Tips to Consider before Creating a Hybrid OR

1. Create a multidisciplinary team across all specialties consisting of physicians, nurses, IT, and administrative directors.
2. Decide if this is a cath lab that can function as an OR or an OR that has cath lab functionality. This will help you determine what to put in the room.
3. Use or create a room as big as you can. The room always begins to shrink as you add equipment.
4. Go on site visits and note the size and space restrictions of the room and equipment. What features do they use and what features offer little benefit? This will help you determine what equipment and features should be included in your hybrid OR.



Hybrid OR: outfitted with an assortment of supporting equipment and features.

Dr. Batra and Dr. Rama in front of the video display with four LEDs that create a window effect.

Dr. Davis proudly presents the focal technology within St. John Hospital's hybrid OR: The Artis zee ceiling-mounted C-arm system.



A Miraculous Touch

Prof. Xinwei Han, MD captains of one of the biggest interventional radiology departments in the world. Zhengzhou University First Affiliated Hospital has almost 10,000 beds and the interventional radiology department consists of 208 beds. He has five Artis systems that work around the clock to treat the patients of the Henan region. He shares his knowledge with regional colleagues to offer cancer patients the best chance of survival regardless of where in Henan they live.

Text: Chen Yi | Photos: Tang Ting Ting

A 50-year-old male patient lies calmly on the operating table. A small sheath is inserted into his femoral artery. He has only received local anesthetic around the puncture site, and his fearless eyes sometimes glance at the strange contraption above his head. It is the flexible C-arm of the Artis zeego robotic interventional system installed in the interventional suite. The interventional radiologists and nurses can adjust the imaging system in hundreds of different ways according to their needs. The two 'eyes' of the robot are two monitors that help the doctors to observe their minimally invasive devices during the procedure.

This is the interventional therapy operating room at Zhengzhou University First Affiliated Hospital. It is ten in the morning, Prof. Xinwei Han, a well-known Chinese professor in the field of interventional radiology, is standing in the control room of the interventional suite. A pane of transparent lead and several pieces of monitoring equipment separate him from the proficient younger surgeons he is mentoring. The patient, who is suffering from primary carcinoma of the liver, is undergoing a super-selective hepatic arteriography chemoembolization. On the same day, a total of 40 patients are scheduled for operations in the interventional therapy department,

some involve cerebrovascular diseases and esophageal stenosis, but the vast majority of patients are fighting illnesses such as stomach cancer, liver cancer, and esophageal cancer.

A Kernel of Rice

In the eyes of a Chinese patient, once he or she has entered the hospital, their life is entirely in the hands of the doctor. Prof. Han stated: "I use the simplest and most easily understandable language and describe this kind of operation as; 'Grabbing the cancer cells by the throat and making them drink a poisonous potion.' Interventional therapy doesn't require a large knife. We make a small opening on the patient's body that isn't larger than a kernel of rice, then we take an interventional device that is about one to three millimeters in diameter and enter a blood vessel. Next we take an embolization agent about the size of a tadpole and insert the agent directly into the area affected by the carcinoma. This achieves a targeted localized treatment. Data related to this procedure is instantaneously entered into the hospital information system, for all of the patient's doctors to review."

Despite having already been in use for more than 40 years globally, and having a history of nearly 30 years in China,